



ಬೆಂಗಳೂರು ಮೆಟ್ರೋ ರೈಲ್ ನಿಗಮ ನಿಯಮಿತ

(ಸಹಭಾಗಿತ್ವದ - ಕರ್ನಾಟಕ ಸರ್ಕಾರ ಹಾಗೂ ಕೇಂದ್ರ ಸರ್ಕಾರ ಉದ್ಯಮ)
ನೋಂದಾಯಿತ ಕಛೇರಿ : ಬಿ.ಎಂ.ಟಿ.ಸಿ. ಕಾಂಪ್ಲೆಕ್ಸ್, 3ನೇ ಮಹಡಿ, ಕೆಂಗಲ್ ಹನುಮಂತಯ್ಯ ರಸ್ತೆ, ಶಾಂತಿನಗರ
ಬೆಂಗಳೂರು - 560 027, ಭಾರತ

Bangalore Metro Rail Corporation Ltd.

(A Joint Venture of Government of Karnataka & Government of India)

Regd. Office : B.M.T.C. Complex, 3rd Floor, K.H. Road, Shanthinagar,
Bangalore - 560 027. INDIA

No. BMRCL/GM/SEMU/Quarterly report/ 2021/01

Date: 01.04.2022

To,

Tree Officer and DCF
BBMP, N R Square
Bangalore-560001

Subject: - Forwarding of Quarterly progress report regarding Translocation & Compensatory
Plantation of trees By Bangalore Metro Rail Corporation Ltd, Bengaluru.

Ref: - 1. OM No.DCF/BBMP/PR-1790/2020-21 dated: 01.03.2021
2. OM No. DCF/BBMP/PR-1923/2020-21 dated: 23.03.2021

As per the above referred OM, BMRCL has to submit the quarterly reports regarding
condition of the Translocated trees and Compensatory Plantation for a period of 03 years.


Accordingly Quarterly progress report from January to March of 2022 showing the condition of
the Translocated trees and Compensatory Plantation is attached here with for necessary action.

Enclosure-As above

Copy to:

1. Managing Director, BMRCL
2. Chief Conservator of Forests, Bengaluru circle
3. Member Secretary, Tree Expert Committee




(Divya S Hosur)
General Manager, SEMU

o/c

WRIT PETITION NO. 17841/2018

**QUARTERLY REPORT REGARDING
TRANSLOCATION OF TREES BELONG TO
OFFICIAL MEMORANDUM ISSUED BY TREE
OFFICER/DCF BBMP BENGALURU FOR
CONSTRUCTION OF METRO RAIL PROJECT IN
BENGALURU.**

(JANUARY-MARCH)

2022

Quarterly Report on implementation of Two Official Memorandum Issued by Tree officer/DCF BBMP Bengaluru for Construction of Metro Rail Project in Bengaluru.

Background: BMRCL had requested the Tree Officer, BBMP Bengaluru for permission to remove the trees giving way for metro rail project in and around the Bengaluru. In lieu of this, The Tree officer (BBMP) has issued Official Memorandum (OM), for removal of 220 trees standing in the project area by means of Translocation and Felling. The Hon'ble High Court of Karnataka granted permission to Bangalore Metro Rail Corporation Limited (BMRCL) for removal of 58 trees by way of translocation, 162 trees by way of felling. As per the KPT, Act 1976 and Hon'ble High Court of Karnataka daily orders for the writ petition No. 17841/2018 BMRCL has to plant 10 tall and healthy saplings for every tree removal in the metro rail construction project. In the OM issued by The Tree Officer/ DCF BBMP, Bengaluru, subjected to following directions for the execution of the work.

Tree Translocation:

A. Agency Selected for Translocation:

Bangalore Metro Rail Corporation Limited Engaged 1No. agency for Translocation and maintenance for a period of 3 years (Table 1). An agreement and letter of acceptance signed between agency and BMRCL for raising the plantation, maintenance and ensuring Satisfactory Survival rate is attached as annexure 1.

Table 1: Details of agencies entrusted for Transplantation work by BMRCL

Sl. No.	Location and OM date	Agency Name	Contract Agreement Date	Work Order Date
01	R6(UG)South ramp (Jayanagar fire station) to Northa ramp (Nagawara)except Langford station and all saint's church	M/s Asian landscape	30.03.2021	30.03.2021

B. Methodology

Pre translocation activities:

i. Pit excavation:

- Based on Girth of tree to be translocated, pit size to be excavated around tree will be decided as per the guidelines of UAS, GKVK, Bengaluru on tree transplantation/translocation following is the pit size for various girth range of tree.

Sl No.	Girth of Tree	Pit size to be excavated around tree
01	0.1m to 0.5m	2.0mx2.0mx2.0m
02	0.5m to 1.0m	2.5mx2.5mx2.5 m
03	1.0m to 1.5m	3.0mx3.0mx3.0m

ii. Root trimming:

The root trimming activity was carried out in four stages, the details of each stage was explained in the annexure-II (guidelines for tree transplanting) of report on tree transplantation/translocation.

iii. Pre-root treatment:

After the root trimming, roots were treated with the antitermite, antibacterial, antifungal and root hormones (the translocation agency used the chemicals specified in the guidelines by UAS, GKVK, Bengaluru).

iv. Crown pruning and cleaning:

- Minimum crown pruning was carried out in the standing tree to reduce the damage while transplanting.
- All the tree species translocated were belong to broad leaved species and found to be layered type of crown.
- In Crow clean activity the unhealthy, damaged, diseased, dead and crossed branches were removed before the transplanting of the tree.

v. Preparation of pit at receptor site:

Before the upliftment of the tree for transplantation, trenches were excavated at the receptor locations and added 15-25 kg of well decomposed matured farmyard manure and watered frequently to maintained soil moisture. Before the planting of the tree the tranches were filled with the mother soil and properly water. The proper amendment of N, P, K and micro nutrients were given to the soils at receptor

locations as per there commendation given in the soil test report of UAS, GKVK, Bengaluru (Annexure-I).

vi. Tree upliftment and transplantation at the receptor location:

- Before the transplantation the earth ball was covered with hessian/gunny bag thoroughly in all sides of the earth ball and moisture was maintained throughout the transportation of the tree.
- At the time of uplifting of the tree the care had to take to keep earth ball intact to the roots and it was observed that all the lateral, secondary and top roots were not infected with fungi, insects or any other microorganisms.
- At the receptor location trees were planted in the same orientation has at the parent location of the tree.

Climatic factors:

- The tree upliftment has been carried out in the rain season.
- The temperature at the time of translocation of the tree was recorded at the range of 25-30 °C

vii. Post planting care:

After the planting an appropriate soil saucer has formed on the soil surface around the edge of the root ball circumference and mulch with dry biomass around the tree to preserve the soil moisture.

C. Tree translocation details.

Sl No.	Official Memorandum	No. of trees for Translocation	Translocation Initiation Date	Translocation completion Date
01	R6(UG)South ramp (Jayanagar fire station) to Northa ramp (Nagawara)except Langford station and all saint's church	58	02.04.2021	01.07.2021

D. Maintenance:

Transplanted Trees maintenance is carried with soil working by pickaxe around the tree. Saucer Bharav: Scraping out of grass and weeds to a radius of 100cms around the tree in the form of semi-circular slanting saucer shape with soil with help of pickaxe and arranging the loosened boulder and soil in semi-circular fashion at the lower side of the plant. The transplanted tree is watered by tanker on periodical basis.

E. Observation and Survival Rate:

The transplanted tree needs to be observed on daily basis for its survival, growth, pests, diseases and other physiological symptoms/ expressions. It is possible to witness temporary wilting of leaves for few days, leaf fall also can happen and the tree may even decide to go in for 'Transitory Dormancy' phase, to avoid moisture loss and desiccation. But can show revival symptoms within months like, new sprouts, turgid leaves, arrest of leaf fall, etc., It is also possible that sometimes, there will be a 'Distress' reaction in the form of premature flowering and fruiting. Also, some trees will exhibit new sprouts within few weeks which may be due to the presence of adequate stored food reserves. Under such circumstances, the new sprouts will not survive for a long and may wither soon. If the tree has not acclimatized, then there will not be any revival symptoms. It should be kept in mind that the transplanted tree has to withstand the tests of at least one year (covering all the three seasons) to declare it as 'surviving or successful'. Hence, any premature conclusions and certifications are restrained.

SI No.	Official Memorandum	No. of trees for Translocation	Response of tree after 6 months of translocation
01	R6(UG)South ramp (Jayanagar fire station) to Northa ramp (Nagawara)except Langford station and all saint's church	58	Revival symptoms were observed

F. Conclusion:

It is submitted that as per the directions of the Hon'ble High Court of Karnataka vide Daily order and Official Memorandum (OM) issued by the tree officer/DCF, BBMP, Bengaluru. The Quarterly Progress report of Translocated Trees for the Quarter January, February & March is here by submitted. It is requested that Tree Officer, Deputy Conservator of Forest, BBMP Bengaluru to kindly consider the same for further needful action by keeping the view the directions of the Hon'ble High Court of Karnataka in WP No 17841/2018.


H.S. Ranganathaswamy
Environment Officer
SEMU, BMRCL
ENVIRONMENT OFFICER
Bengaluru Metro Rail Corporation Ltd.
Shanthinagar, Bengaluru

Enclosures:


- | | |
|---|----------------|
| 1. Contract Agreement and Work Order | - Annexure-I |
| 2. Guidelines for Tree Transplanting | - Annexure-II |
| 3. Soil Report | - Annexure-III |
| 4. Maps Pertaining to Translocation of Tree | - Annexure-IV |
| 5. Tree Translocation Photographs | - Annexure-V |

— 2 —

With reference to the above subject, I, S. Prabhakar, the authorized signatory for M/s Asian Landscape, #489, Farm House, Balageri road, Varthur, Bangalore-87, do hereby state that we, M/s Asian Landscape, #489, Farm House, Balageri road, Varthur, Bangalore-87, have entered into a contract agreement dated 30.03.2021 with Bangalore Metro Rail Corporation Ltd (BMRCL), Bangalore, for translocation of 58 trees standing between South Ramp (Jayanagara Fire Station) to North Ramp (Nagawara) on Reach 6 UG and we hereby agree and undertake to abide by and comply with terms and conditions of the work order and the agreement and guidelines for tree translocation prescribed by UAS, GKVK Committee, in all respects and we shall be liable for any violation of the said agreement. Further, we also hereby undertake to maintain the translocated 58 trees for 36 months (3 years) from the date of translocation of each tree.

With regards and Thanking you,

Yours faithfully,


(S. prabhakar)



सत्यमेव जयते

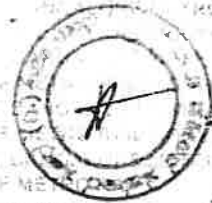
INDIA NON JUDICIAL

Government of Karnataka

Rs. 200

e-Stamp

Certificate No. : IN-KA88697078804089T
Certificate Issued Date : 26-Mar-2021 04:11 PM
Account Reference : NONACC (FI)/ kabacs108/ M G ROAD/ KA-BA
Unique Doc Reference : SUBIN-KAKABACSL0849960284146049T
Purchased by : ASIAN LANDSCAPE
Description of Document : Article 12 Bond
Description : CONTRACT AGREEMENT
Consideration Price (Rs.) : 0
First Party : BANGALORE METRO RAIL CORPORATION LTD
Second Party : ASIAN LANDSCAPE
Stamp Duty Paid By : ASIAN LANDSCAPE
Stamp Duty Amount (Rs.) : 200
 (Two Hundred only)



Please write or type below this line

Contract Agreement

Translocation of 58 Nos trees standing in between South Ramp (Jayanagar Fire Station) to North Ramp (Nagawara) on Reach- 6 UG infringing Metro works

(No. BMRCL/0163/P-2/CE-UG/RT-01/BBMP/2020/12677 Dated: 26.03.2021)

This Contract Agreement (hereinafter called the "Contract") is made at Bengaluru on this the 30th day of March 2021 by and between:

Statutory Alert:

1. The authenticity of this Stamp certificate should be verified at www.shcilestamp.com/ or using e-Stamp Mobile App of Stock Holding.
2. Any discrepancy in the details on this Certificate and as available on the website / Mobile App renders it invalid.
3. The onus of checking the legitimacy is on the users of the certificate.
3. In case of any discrepancy please inform the Competent Authority.

25

BANGALORE METRO RAIL CORPORATION LIMITED, a Public Limited Company incorporated under Companies Act, 1956, having its registered office at III Floor, BMTCL Complex, K.H.Road, Shanthinagar, Bengaluru-560027, represented herein by **Mr. S S Hegaraddi, ED- 1 (Civil)** hereinafter referred to as "BMRCL" or "Employer", as the case may be, which expression shall unless excluded by or repugnant to the context or meaning thereof be deemed to include its successors and assigns of the first part.

AND

M/s Asian Landscape having its registered office at # 489, Farm House, Balageri Road, Varthur, Bangalore- 87 represented herein by **Mr S. Prabhakar** who is duly authorized to sign and hereinafter referred to as the "Contractor", which expression shall unless excluded by or repugnant to the context or meaning thereof be deemed to include its successors and assigns, of the other part.

WHEREAS, the Contractor in accordance with Indian law offered a quotation and the quotation has been accepted by the Employer for the execution and completion, and remedying of any defects in the work of **"Translocation of 58 Nos trees standing in between South Ramp (Jayanagar Fire Station) to North Ramp (Nagawara) infringing Metro works and maintenance of 58 trees"**. The Contractor agrees to undertake performance of the contract work under the terms and conditions set forth in this Contract.

AND WHEREAS, the Employer agrees to hire and the Contractor agrees to be hired to implement the work of **"Translocation of 58 Nos trees standing in between South Ramp (Jayanagar Fire Station) to North Ramp (Nagawara) infringing Metro works"** under the terms and conditions specified in this Contract Agreement and the other Contract Documents.

Now THEREFORE the parties hereby agree as follows:

Clause 1 Words and Expressions:

In this Contract all the words and expressions shall have the same meanings as are respectively assigned to them in the conditions of contract hereinafter referred to,

Clause 2 The Contract Documents:

The Notice inviting quotations, Rate Schedule, Work Order (Attached as Annexure- I), methodology approved by Tree Expert Committee (TEC) (Attached as Annexure- II), shall be deemed to form and be read and construed as a part of this Contract Agreement.

Clause 3 Obligations of the Contractor:

3.1 The mutual rights and Obligations of the Employer and the Contractor shall be as set forth in the Contract and in particular: -



For ASIAN LANDSCAPES

Proprietor

28

The Contractor agrees, subject to the terms and conditions of the Contract, to perform efficiently and faithfully the work of **"- Translocation of trees standing in between South Ramp (Jayanagar Fire Station) to North Ramp (Nagawara) infringing Metro works** and work shall be carried out as per guidelines issued by TEC (Attached as Annexure- II) and other facilities requisite for or incidental to the successful completion of the work and in carrying out all duties and obligations imposed by the Contract.

Clause 4 Obligations of the Employer:

The Employer agrees, subject to the terms and conditions of the Contract, to pay the Contractor the amount specified, and at the rates and terms and in the manner set forth in the Contract.

Clause 5 Contract Price:

5.1 The Employer agrees to pay the Contractor the total amount mentioned below (hereinafter called 'the Contract Price') and the Contractor agree to accept the total amount mentioned below for the work carried out by them as part of their obligations, responsibilities and liabilities under and according to the provisions and obligations imposed on them by the Contract for translocation of 58 no's trees and their maintenance for a period of 03 years.

INR 13,92,000/- (Indian Rupees Thirteen Lakhs and Ninety Two Thousand only) which Excludes all applicable taxes, duties, royalty and Cess.

5.2 The Contract Price mentioned above will be increased or decreased during the period of performance of the Contract as specifically provided, if any, in the Conditions of Contract and no additional amount on any other account whatsoever shall be payable to the Contractor.

Clause 6 Completion Time:

6.1 The duration for Translocation of trees shall be 90 (Ninety) Days from the date of issue of work order (As per approved methodology) and Maintenance of these Translocated trees for a period of 03 Years from date of completion of translocation.

Clause 7 Integration:

The Employer and the Contractor agree that this Contract Agreement, together with the other Contract Documents, expresses all the agreements, understandings, promises, and covenants of the parties, and integrates, combines, and supersedes all prior and contemporaneous negotiations, understandings, and agreements, whether written or oral and no modification or alteration of the Contract shall be valid or binding on either party, unless expressed in writing and executed with the same formality as this Contract Agreement, except as may otherwise be specifically provided in the Contracts Documents. The Notice inviting quotation, Rate Schedule,



For ASHWINI
P. S. V.
13

28

Work order (Attached as Annexure- I), Methodology approved by Tree expert Committee (Attached as Annexure- II) are part of the Agreement.

Clause 8 Governing Law:

This Contract is enforceable and construed under the applicable laws of the Republic of India.

Clause 9 Language:

This Contract Agreement and the other Contract Documents are made in the English language.

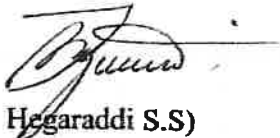
Clause 10 Jurisdiction of Court:

The Court at **Bengaluru** shall have the exclusive jurisdiction to adjudicate all the disputes arising out of or concerning this Agreement between the parties.

IN WITNESS WHEREOF, the parties hereto have caused this Contract Agreement to be signed in their respective names by their authorized representatives as of the day and year first written.

For Bangalore Metro Rail Corporation Ltd

(Employer)




(Mr. Heggaraddi S.S)
Executive Director(Civil-1)

For M/s Asian Landscape

(Contractor)

FOR ASIAN LANDSCAPES


(S. Prabhakar)
Proprieter

Witness



R.G. Sharbhay

Dy. CE/UG/R201/BRM

Witness



ಬೆಂಗಳೂರು ಮೆಟ್ರೋ ರೈಲ್ ನಿಗಮ ನಿಯಮಿತ

(ಸಹಭಾಗಿತ್ವದ - ಕರ್ನಾಟಕ ಸರ್ಕಾರ ಹಾಗೂ ಕೇಂದ್ರ ಸರ್ಕಾರ ಉದ್ಯಮ)
ನೋಂದಾಯಿತ ಕಛೇರಿ : ಬಿ.ಎಂ.ಟಿ.ಸಿ. ಕಾಂಪ್ಲೆಕ್ಸ್, 3ನೇ ಮಹಡಿ, ಕೆಂಗಲ್ ಹನುಮಂತಯ್ಯ ರಸ್ತೆ, ಶಾಂತಿನಗರ
ಬೆಂಗಳೂರು - 560 027, ಭಾರತ

Bangalore Metro Rail Corporation Ltd.

(A Joint Venture of Government of Karnataka & Government of India)

Regd. Office : B.M.T.C. Complex, 3rd Floor, K.H. Road, Shanthinagar,
Bangalore - 560 027, INDIA

BMRCL/0163/P-2/CE-UG/RT-01/BBMP/2021/12677
Ref: your quotation no nil dated 26/03/2021

Date: 30.03.2021

To
M/s Asian LandScape
489, Farm House, Balageri Road, Varthur
Bangalore- 87

Sir,
Sub: - Translocation of trees falling between South Ramp (Jayanagar Fire Station) to North Ramp (Nagawara) on Reach 6 UG, BMRCL.

With reference to your quotation dated 26/03/2021 and subsequent discussions held with us in our office, we are pleased to award this work at a cost of Rs. 13,92,000/- (Rupees thirteen lakh ninety two thousand Only) excluding GST for Translocation of Trees for Bangalore Metro Rail Corporation as per the below Scope, BOQ, guidelines for translocation of trees given by GKV, other Terms and Condition.

Scope & BOQ:

Scope /Description of Works	Rate Per Tree (Rs.)	Qty. (in Nos.)	Amount (Rs.)
Translocation of trees from existing location to the Receptor site as per the details below with all machinery/equipment, men at all lead and lifts, etc. complete as under: Trimming of tree branches to facilitate proper handling of the tree during lifting and transportation. Preparation and application of chemicals on cut edges of roots, shoots etc. Preparation of earth ball of tree root stock of desired depth and diameter, trimming, cutting and tending of exposed roots. Dislodging, lifting the tree with crane/s of suitable capacity, transportation by crane (if the distance is bearable) or transportation by truck (if the distance is more than the bearable range) as the case may be (The Approved Guide lines received from UAS GKV attached) Excavation of pits of adequate size and planting the tree at designated location by properly anchoring and balancing with the help of cranes and experienced workers. Consolidation at the base portion of the tree and other relevant works. Maintenance after transplantation by Hoeing and soil working with pickaxe around the tree, Saucer bhavar: Scraping out of grass and weeds to a radius of 100 cms around the tree in the form of semicircular slanting saucer shape with soil with the help of pick axe and arranging the loosened boulders and soil in semicircular fashion at the lower side of the plant and watering each tree once in 7 days by tankers on periodical basis for 36 months (3 Years).			
i. For Translocation of Trees Up to and including girth of 2.5mts	17000/-	58	9,86,000/-
ii. For Maintenance after Translocation of Tree for 36 months (3 Years)	7000/-	58	4,06,000/-
Total			13,92,000/-

(Rupees thirteen lakh ninety-two thousand only)

...2

Proprietary

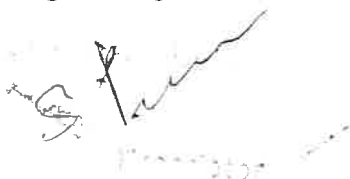
29

-2-

TERMS AND CONDITIONS

1. **Timelines:** The tree translocation work has to be completed within 90 days from the date of issue of this Work Order and maintenance work has to be carried for an period of 03 Years.
2. Work shall be carried out under the technical supervision of Forest Wing, Bangalore urban, Aranya Bhavan, Bangalore and Environment officer, BMRCL.
3. Watering and maintenance shall be carried out as per the agreed conditions, as per silvicultural systems. Sufficient watering shall be carried out for survival and further growth.
4. M/s Asian Landscape have to deploy all the required machinery like cranes, JCBs, trucks tools & plants etc. and experienced workers for this work.
4. Videos of transplantation process shall be submitted by way of CDs/pen drives after completion of the work.
5. After successful completion of 10 trees or its multiples, part amount shall be released as per the running bill.
6. During pruning/trimming of branches of **huge trees**, which are adjacent to roads or lanes, BMRCL shall provide necessary support, for coordination with traffic police for blocking/diversion of traffic.
8. After completion of work **M/s Asian Land Scape** have to clear all the debris/branches leaves and other items.
9. M/s Asian Landscape must follow necessary safety guidelines and take utmost care while carrying out this work.
10. The procedure approved by the Tree Expert Committee for the Tree translocation is also enclosed for strict compliance and execution.
11. It shall be noted that you should enter into a contract agreement with BMRCL on a non-Judicial stamp paper of worth Rs 200/- within 10 days from date of work order.
12. The work order is sent herewith to you in duplicate. You are requested to return one copy of it duly signed by the authorised signatory on all pages indicating "Unconditional Acceptance" thereof so as to reach the undersigned within one week of the receipt of this work order.
13. Quarterly report of Condition of transplanted trees along with Photos to be submitted to the BMRCL concerned Engineering authorities.

...3





30
-3-

Payments

1. Applicable GST shall be paid in addition to the above unit rates.
2. Transplantation: 50% payment shall be released after completion of transplantation works. Balance 20% shall be released after 60 days after ascertaining the signs of survival. Payment shall be made only towards surviving trees.
3. Maintenance: 40% of the payment towards maintenance shall be released after 60 days after ascertaining the signs of success. Payment shall be released only for surviving trees.
4. Transplantation: Balance 20% amount will be released after 18 months after ascertaining the signs of survival against survival of transplanted trees. Payment shall be made only towards surviving trees.
5. Maintenance: 30% of the balance payment towards maintenance shall be released after completion of 18 months from date of transplantation. Payment shall be released for surviving trees only.
6. Transplantation: Balance 10 % amount will be released after 36 months after ascertaining the signs of survival against survival of transplanted trees. Payment shall be made only towards surviving trees.
7. Maintenance: Last installment of balance 30% payment towards maintenance will be released after completion of 36 months from the date of transplantation. Payment shall be released for surviving trees only.
8. Note : Payment shall be released for surviving trees only.
9. This work order is sent in duplicate. Kindly acknowledge/ sign the copy as a token of your acceptance and submit the same to us for our records.

Receptor site Details: -

- a) Bangalore Co-operative Union Ltd. premises (KMF) Bengaluru
- b) National Dairy Research Institute premises Bengaluru
- c) Parade Ground, M G Road premises Bengaluru
- d) Old Military Dairy Farm premises Hebbal, Bengaluru

Yours faithfully,

Subrahmanya Gudge 30.03.21

(Subrahmanya Gudge)
Chief Engineer (UG)

Enclosures: As above
For ASIAN LANDSCAPES.

Proprietor



सत्यमेव जयते

39

Annexure-AR

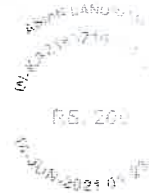
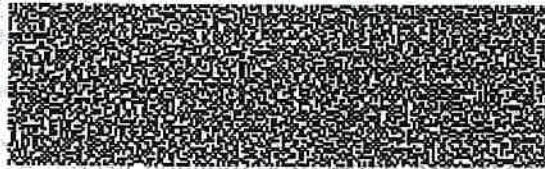
INDIA NON JUDICIAL

R6.

Government of Karnataka

e-Stamp

Certificate No. : IN-KA21632167437831T
Certificate Issued Date : 14-Jun-2021 01:23 PM
Account Reference : NONACC (FI)/ kaksfci08/ HALASURU/ KA-BA
Unique Doc. Reference : SUBIN-KAKAKSFCL0812289884310123T
Purchased by : ASIAN LANDSCAPE
Description of Document : Article 12 Bond
Description : CONTRACT AGREEMENT
Consideration Price (Rs.) : 0
 (Zero)
First Party : BANGALORE METRORAIL CORPORATION LIMITED
Second Party : ASIAN LANDSCAPE
Stamp Duty Paid By : ASIAN LANDSCAPE
Stamp Duty Amount(Rs.) : 200
 (Two Hundred only)



Please write or type below this line

Supplementary Agreement

- Ref:1. Letter from DCF BBMP No. CF/PR.467/2021-2 dated 19.06.2021
2. Honorable High Court Order dated:11.06.2021.
3. Contract agreement dated 30.03.2021.
4. Work Order No: BMRCI/0163/P-2/CE-UG/RT-01/BBMP/2020/12677 dated: 30.03.2021.
5. Official Memorandum letter No: DCF/BBMP/PR/1923/2021dated :23.03.2021.

This supplementary agreement has been entered into on this 19th day of June 2021 between

[Signature]

Statutory Alert:

1. The authenticity of this Stamp certificate should be verified at 'www.shcilestamp.com' or using e-Stamp Mobile App of Stock Holding
 Any discrepancy in the details on this Certificate and as available on the website / Mobile App renders it invalid.



BANGALORE METRO RAIL CORPORATION LIMITED, a Public Limited Company incorporated under Companies Act, 1956, having its registered office at III Floor, BMTC Complex, K.H. Road, Shanthinagar, Bengaluru-560027, represented herein by **Mr. S S Hegaraddi, ED- 1 (Civil)** hereinafter referred to as "BMRCL" or "Employer", as the case may be, which expression shall unless excluded by or repugnant to the context or meaning thereof be deemed to include its successors and assigns of the first part,

And

M/s Asian Landscape having its registered office at # 489, Farm House, Balageri Road, Varthur, Bangalore- 87 represented herein by **Mr S. Prabhakar** who is duly authorized to sign and hereinafter referred to as the "Contractor", which expression shall unless excluded by or repugnant to the context or meaning thereof be deemed to include its successors and assigns, of the other part.

And whereas BMRCL entrusted work of Transplanting 58 trees existing in Underground Station areas between Dairy Circle and Nagawara vide workorder dated 30.03.2021 at a cost of Rs. 13,92,000/- (Copy enclosed of Annexure – A). Terms of the Contract to perform above work have been mentioned in Contract Agreement signed by M/s BMRCL and M/s Asian Landscape on 30.03.2021

To perform the contract satisfactorily, the parties have desired to enter into this Supplementary Agreement with following additional conditions. .

- 1) The parties hereby agree that Boundary co-ordinates of locations where the trees are existing in the Underground Station areas and co-ordinates of the intended locations for translocation of trees are as under.

Present Location : Dairy Circle

Proposed Location: Bangalore Co-operative Milk Union Ltd. (KMF) Premises

Extent : 0.33 Ha

North Side – Private Building/BOSCH Compound Wall

South side – Primary School

West side – Nandini Quarters

East side – 6th E Cross Road


S. S. HEGARADDI
Executive Director (Civil)
Bangalore Metro Rail Corporation Limited



: 3: 41

SL No	Tree No.	Species	GBH (Mtrs)	Present Location of Trees {Latitude (N) / Longitude (E)}	Boundary Coordinates of Proposed Location for Transplantation of Trees {Latitude (N) / Longitude (E)}	Recommended Translocation Area
1	1	Jamun	1.80	12°56'23.025"N / 77°36'7.285"E	<p>Point (A) 12°56'22.03 N 77°36'24.615 E</p> <p>Point (B) 12°56'21.767 N 77°36'27.399 E</p> <p>Point (C) 12°56'20.152 N 77°36'27.13 E</p> <p>Point (D) 12°56'20.244 N 77°36'25.631 E</p>	Bangalore Co-operative Milk Union Ltd. (KMF) Premises, Bengaluru Extent : 0.33 Ha
2	4	Neem	0.37	12°56'23.527"N / 77°36'7.448"E		
3	5	Neem	0.75	12°56'23.662"N / 77°36'7.449"E		
4	7	Neem	0.90	12°56'24.484"N / 77°36'7.676"E		
5	9	Jamun	2.00	12°56'25.079"N / 77°36'7.795"E		
6	10	Jamun	0.90	12°56'26.630"N / 77°36'8.176"E		
7	11	Mango	0.60	12°56'23.025"N / 77°36'8.616"E		
8	18	Mango	0.85	12°56'26.630"N / 77°36'8.176"E		
9	19	Honge	1.15	12°56'26.824"N / 77°36'8.084"E		
10	21	Neem	0.90	12°56'27.470"N / 77°36'8.236"E		
11	35	Peepal	1.50	12°56'25.810"N / 77°36'9.235"E		
12	36	Peepal	1.65	12°56'25.764"N / 77°36'9.006"E		
13	37	Jamun	1.20	12°56'24.516"N / 77°36'8.711"E		
14	Un-numbered	Bannimara	1.30	12°56'26.823"N / 77°36'9.662"E		


S. S. HEGARADDI
 Executive Director (Civil)
 Bangalore Metro Rail Corporation Limited



Present Location : Lakkasandra

Proposed Location: National Dairy Research Institute (NDRI) Premises Extent: 0.30 Ha

North Side – Pond

South side – Slum

West side – Open Field

East side – Open Field

SL No	Tree No.	Species	GBH (Mtrs)	Present Location of Trees {Latitude (N) / Longitude E}	Boundary Coordinates of Proposed Location for Transplantation of Trees {Latitude (N) / Longitude (E)}	Recommended Translocation Area
15	22	Rain Tree	2.10	12°56'55.035"N/7°36'9.730"E	Point (A) 12°56'55.118 N 77°36'52.5 E Point (B) 12°56'55.099 N 77°36'53.792 E Point (C) 12°56'51.46 N 77°36'52.623 E Point (D) 12°56'51.585 N 77°36'52.08 E	National Dairy Research Institute (NDRI) Premises, Bengaluru Extent: 0.30 Ha
16	23A	Spathodea	0.90	12°56'58.404"N/7°36'10.557"E		
	23B	Spathodea	1.00			
17	24	Banyan tree	0.85	12°57'0.073"N/77°36'11.551"E		
18	25	Peepal	4.50	12°57'0.387"N/77°36'12.509"E		
19	26	Jamun	1.40	12°56'58.133"N/7°36'11.547"E		
20	28	Fig	3.20	12°56'55.752"N/7°36'11.048"E		
21	31	Mango tree	0.85	12°56'54.215"N/7°36'10.402"E		
22	33	Peepal	2.50	12°56'53.643"N/7°36'9.882"E		


S. S. HEGARADDI
 Executive Director (Civil)
 Bangalore Metro Rail Corporation Limited



Present Location : MG Road

Proposed Location: Parade Ground Premises

Extent: 0.068 Ha

North Side – Cubbon Road

South side – Manekshaw Parade Ground

West side – Manekshaw Parade Ground

East side – Kamaraj Road

SL No	Tree No.	Species	GBH (Mtrs)	Present Location of Trees {Latitude (N) / Longitude E}	Boundary Coordinates of Proposed Location for Transplantation of Trees {Latitude (N) / Longitude (E)}	Recommended Translocation Area
23	74	Honge	1.30	12°58'39.302N / 77°36'32.378" E	Point (A) 12°58'38.10 N 77°36'28.404 E Point (B) 12°58'38.136 N 77°36'29.016 E Point (C) 12°58'37.236 N 77°36'29.88 E Point (D) 12°58'37.056 N 77°36'29.556 E Point (D) 12°58'37.416 N 77°36'28.836 E	Parade Ground Premises, Cubbon Road, Bengaluru 0.068 Ha
24	77	Sampige	0.90	12°58'38.103"N/ 77°36'32.033" E		
25	78	Mahagani	1.40	12°58'37.912"N/ 77°36'32.386" E		
26	79	Mahagani	1.00	12°58'37.617"N/ 77°36'30.449" E		
27	80	Mahagani	1.60	12°58'37.711"N/ 77°36'30.182" E		
28	81	Basavanapada	0.55	12°58'37.948"N/ 77°36'30.181" E		



S. S. HEGARADDI
Executive Director (Civil)

Present Location : Cantonment station

Proposed Location: Old Military Dairy Farm Premises

Extent: 2.62 Ha

North Side – Private Buildings

South side – Open Land

West side – Godwin Public School

East side – Military Quartos

SL No	Tree No.	Species	GBH (Mtrs)	Present Location of Trees {Latitude (N) / Longitude E}}	Boundary Coordinates of Proposed Location for Transplantation of Trees {Latitude (N) / Longitude (E)}	Recommended Translocation Area
29	3	Sampige tree	0.90	12°59'33.816"N / 77°36'23.171"E	Point (A) 13°03'21.96 N 77°34'58.67 E Point (B) 13°03'25.52N 77°35'00.50 E Point (C) 13°03'22.30N 77°35'07.60 E Point (D) 13°03'20.19N 77°35'06.71 E Point (E) 13°03'20.63N 77°35'05.56 E Point (F) 13°03'19.73N 77°35'04.16 E	Old Military Dairy Farm Premises, Hebbal, Bengaluru Extent: 2.62 Ha

S. S. HEGARADDI
Executive Director (Civil)

Bangalore Metro Rail Corporation Limited



7: 45

Present Location : Tannery Road

Proposed Location: Old Military Dairy Farm Premises

Extent: 2.62 Ha

North Side – Private Buildings

South side – Open Land

West side – Godwin Public School

East side – Military Quarters

SL No	Tree No.	Species	GBH (Mtrs)	Present Location of Trees {Latitude (N) / Longitude (E)}	Boundary Coordinates of Proposed Location for Transplantation of Trees {Latitude (N) / Longitude (E)}	Recommended Translocation Area
30	4	Sampige	0.70	13°0'36.779"N/ 77°36'52.419"E	Point (A) 13°03'21.96 N 77°34'58.67 E	Old Military Dairy Farm Premises, Hebbal, Bengaluru Extent: 2.62 Ha
31	9	Jack fruit	1.10	13°0'36.647"N/ 77°36'52.65"E	Point (B) 13°03'25.52N 77°35'00.50 E	
32	12	Mango	0.65	13°0'36.484"N/ 77°36'52.648"E	Point (C) 13°03'22.30N 77°35'07.60 E	
33	19	Mango	1.20	13°0'35.965"N/ 77°36'52.51"E	Point (D) 13°03'20.19N 77°35'06.71 E	
34	27	Ashoka	0.85	13°0'36.166"N/ 77°36'51.915"E	Point (E) 13°03'20.63N 77°35'05.56 E	
35	43	Honge	0.45	13°0'36.101"N/ 77°36'51.882"E	Point (F) 13°03'19.73N 77°35'04.16 E	
36	46	Arali	1.25	13°0'35.451"N/ 77°36'51.875"E		

Present Location : CC-1, Nagawara Station

Proposed Location: Old Military Dairy Farm Premises, Hebbal, Bengaluru,

Extent: 2.62 Ha

North Side – Private Buildings

South side – Open Land

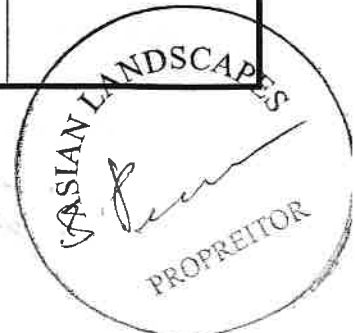
West side – Godwin Public School

East side – Military Quarters

SL No	Tree No.	Species	GBH (Mtrs)	Present Location of Trees {Latitude (N) / Longitude (E)}	Boundary Coordinates of Proposed Location for Transplantation of Trees {Latitude (N) / Longitude (E)}	Recommended Translocation Area
37	2	Honge	0.28	13°2'41.561"N/ 77°37'38.213"E	Point (A) 13°03'21.96 N 77°34'58.67 E	Old Military Dairy Farm Premises, Hebbal, Bengaluru Extent: 2.62 Ha
38	4	Aralimar a	0.75	13°2'41.336"N/ 77°37'38.045"E		
39	12	Honge	0.70	13°2'38.594"N/ 77°37'35.827"E	Point (B) 13°03'25.52N 77°35'00.50 E	
40	14	Honge	0.80	13°2'38.827"N/ 77°37'35.299"E		
41	22	Mango	0.50	13°2'30.22"N/ 77°37'30.895"E	Point (C) 13°03'22.30N 77°35'07.60 E	
42	29	Mango	0.45	13°2'29.763"N/ 77°37'31.09"E		
43	30	Mango	0.35	13°2'29.796"N/ 77°37'31.024"E	Point (D) 13°03'20.19N 77°35'06.71 E	
44	33	Mango	0.75	13°2'29.864"N/ 77°37'30.792"E		
45	36	Nerale	0.75	13°2'29.703"N/ 77°37'30.625"E	Point (E) 13°03'20.63N 77°35'05.56 E	
46	38	Jack fruit	0.85	13°2'29.668"N/ 77°37'30.823"E		
47	39	Badami	0.85	13°2'29.504"N/ 77°37'30.954"E	Point (F) 13°03'19.73N 77°35'04.16 E	
48	43	Honge	0.60	13°2'28.885"N/ 77°37'31.113"E		
49	45	Honge	0.80	13°2'27.878"N/ 77°37'30.937"E		

S.S. HEGARADDI
Executive Director (Civil)

Bangalore Metro Rail Corporation Limited




SL No	Tree No.	Species	GBH (Mtrs)	Present Location of Trees {Latitude (N) / Longitude (E)}	Boundary Coordinates of Proposed Location for Transplantation of Trees {Latitude (N) / Longitude (E)}	Recommended Translocation Area
50	52	Jeevi	1.00	13°2'26.501"N/ 77°37'28.866"E	Point (A) 13°03'21.96 N 77°34'58.67 E Point (B) 13°03'25.52N 77°35'00.50 E Point (C) 13°03'22.30N 77°35'07.60 E Point (D) 13°03'20.19N 77°35'06.71 E Point (E) 13°03'20.63N 77°35'05.56 E Point (F) 13°03'19.73N 77°35'04.16 E	Old Military Dairy Farm Premises, Hebbal, Bengaluru Extent: 2.62 Ha
51	54	Jeevi	0.70	13°2'26.502"N/ 77°37'28.733"E		
52	57	Arali	0.84	13°2'24.878"N/ 77°37'28.484"E		
53	59	Badami	0.25	13°2'24.192"N/ 77°37'28.808"E		
54	61	Arali	0.75	13°2'21.61"N/ 77°37'26.89"E		
55	64	Jack fruit	0.75	13°2'20.657"N/ 77°37'27.809"E		
56	74	Mango	0.36	13°2'18.616"N/ 77°37'27.058"E		
57	75	Mango	0.52	13°2'18.649"N/ 77°37'26.992"E		
58	79	Melia Dubia	0.70	13°2'18.552"N/ 77°37'26.958"E		

The contractor hereby agrees to transplant the above 58 trees in the locations as proposed above.

- The contractor hereby agrees to strictly Adhere to all the guidelines for transplantation of trees as mentioned in Report of GKVK, which is part of work order dated 30.03.2021 / Agreement date 30.03.2021.

In case of meeting obstructions like rock, abandoned foundation or any other obstruction to replant the tree in any intended location, the tree shall be replanted in a nearest possible location.

Now THEREFORE the parties hereby agree to adhere to all the terms and conditions (Clause 01 to 10) of the Contract Agreement dated 30.03.2021.


S. S. MEGARADDI
Executive Director (Civil)
Bangalore Metro Rail Corporation Limited



IN WITNESS WHEREOF, the parties hereto have caused this Supplementary Contract Agreement to be signed in their respective names by their authorized representatives as of the day and year first written.

For Bangalore Metro Rail Corporation Ltd

(Employer)



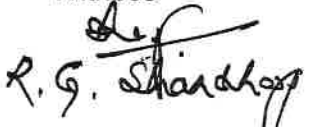
(Mr. Hegaraddi S.S.)

Executive Director (Civil-1)

S. S. HEGARADDI
Executive Director (Civil)

Chief Engineer
Bangalore Metro Rail Corporation Limited

Witness



R.G. Shankar
By. CE/BMRCL

For M/s Asian Landscapes

(Contractor)



Witness

Guidelines for tree transplanting

Transplanting is the term used to describe the digging and replanting of trees from one location to a new location. Due to the wide extent and morphology of tree root system, transplanting of trees usually involves substantial removal of roots. The whole transplanting process in particular for large trees is an engineering feat and requires substantial involvement of resources and time.

A decision to transplant a tree should be based on a balancing consideration of its conditions, size, species, conservation status, amenity value, suitability for transplanting, environmental and cultural factors, functional and engineering considerations and cost effectiveness.

Species:

Trees having particular significance and high conservation value would be recommendable for transplanting in case they cannot be preserved on site. Identified trees should be healthy and structurally sound, and invasive exotic tree species should not be considered for transplanting.

Age, height and girth:

Conditions of the trees to be transplanted including health, form and structure will affect the success of the proposed transplanting.

The lifespan and health of the trees after transplanting have to be considered before transplanting to assess the cost effectiveness of the operation.

Trees with poor form/architecture, health or structure should not be considered for transplanting. If the tree has poor health, the rates of survival and recovery will be low. Trees suffer substantial stress and shock during construction and transplanting. A transplanted tree should be able to re-establish sufficient roots to sustain itself.

Root system:

Larger trees need bigger root ball to encompass more roots to ensure adequate re-growth, as well as anchorage and stability. Transplanting may not be recommendable for situation where a reasonable root ball size cannot be achieved. International practices generally recommend a range of 8:1 to 10:1 for root ball diameter: trunk diameter. A larger root ball is recommendable for more mature trees to enhance better recovery after transplanting.

Root pruning is sometimes required before transplanting a tree. Sufficient time should be allowed between preparation and final lifting for development of new roots capable of sustaining and continuing the growth of the transplanted tree.

Soil type:

Trees growing on slopes, retaining walls or areas where formation of a root ball of reasonable size is not practicable are considered not transplantable. Trees should not be transplanted to non-fertile soils like lateritic soil.

Distance to travel:

Access to existing and receptor locations, manoeuvring spaces and transportation to the receptor site (including availability of access to accommodate the tree, topography of proposed route, engineering limitation, etc.) and other site constraints should be considered.

Large transplanting machine may be needed. Accessibility of the site should be considered including the movement and set up of the transplanting equipment and the manoeuvrability of the operation machinery and vehicles.

Season of transplant:

Summer is not a common transplanting season as evapo-transpiration rate is high and the transplanted trees will be under stress when transplanting work is taken place during that time.

Pre and Post care:

- a) **Pit size:** The height, breadth and depth of pits depends on tree girth size

Table.1: Pit size based on tree girth size

S.No	Pit size (m ³)	Girth class (m)	Size of the tree
1	2.0 X 2.0 X 2.0	0.1 to 0.5	Small
2.	2.5 X 2.5 X 2.5	0.5 to 1.0	Medium
3.	3.0 X 3.0 X 3.0	1.0 to 1.5	Large

b) Digging:

- **Stage 1:** Dig a trench on the outside of the marked circumference in only two opposing segments.
- **Stage 2:** After a period of not less than 1 month since the first root pruning, dig a trench on the outside of the marked circumference in the adjacent two opposing segments.
- **Stage 3:** After another period of not less than one month since the second root pruning, dig a trench on the outside of the marked circumference, in the remaining two opposing segments.
- **Stage 4:** After a further period of not less than 1 month since the third root pruning, prepare the root ball and cut the underside of the root ball, followed by uplifting and transplanting.

- c) **Root trimming:** Cuts must be clean to avoid tearing or breaking the roots. All cut roots shall be trimmed cleanly back to the healthy tissues to reduce the split and torn roots. Sharp cut ends can promote a flush of new fibrous roots, helping the trees recover faster from injuries.

- d) **Crown pruning and cleaning:** Pruning of tree crown during transplanting may not be necessarily beneficial to the trees as thinning the crown can reduce the tree's capability in making food and building up reserves. Excessive pruning can ruin the natural form of a tree and reduce photosynthesis.

Crown cleaning however can be carried out to remove unhealthy, damaged,

diseased, dead and crossed branches so as to minimise susceptibility to pests and diseases.

- e) **Pre root treatment:** Tree roots should be treated with antitermite, antibacterial, antifungal and root hormones.

Table 2: Active ingredients of root treatment chemicals

S.No	Name	Chemical Name	Active ingredient	Quantity/tree (L)
1	Anti-termite	Chloropyriphos 20% EC	4 mL/3 L water	8
2	Anti - bacterial	Bactinash 200	17 g/3 L water	2
3	Anti - fungal	Corbondazim (Bavistin)	2 g/3 L water	15
4	Root hormone	IBA	2000 ppm	20

- f) **Preparation of pit at receptor site:** Tree lifting operations shall be carefully timed so as to enable direct delivery to the receptor site. No transplanting operations should commence until either the receptor site or the holding nursery is fully prepared. Tree uplifted must be transplanted and watered the same day. Watering before lifting is recommended.

Before uplifting, the outer edge of the previously dug trenches at receptor site shall be loosened from the surrounding soil and add 15 -25 kg of vermicompost or well decomposed matured farmyard manure or any compost per pit and watered to maintain soil moisture for longer time and easy establishment of roots.

- g) **Damp hessian (Gunny bag):** is placed on the sides and across the tip of the ball and pinned. The hessian should cover the full circumference of the root ball with bottom skirt hanging out. This skirt is pinned to the root ball later after the tree is taken out of the hole. The base of the root ball should also be properly wrapped. This hessian shall be kept moist throughout the time of uplifting until the uplifted tree is transplanted in its new location.
- h) **Lifting and handling of trees:** Lifting should be done by direct lift, with padded protection for the tree, using a machine of appropriate capacity connected to the support around the root ball, not to any other part of the tree. Tree should not be lifted by the trunk as this can cause serious trunk injury but by its root ball which should be properly prepared and wrapped.
- i) **Planting:** Tree should preferably be placed in the same orientation from which they originated. Any branches damaged in transit should be properly pruned back to the nearest branch bark ridge.
- j) **After care/ post planting care:** Immediately following planting and where appropriate, a soil saucer can be formed on the soil surface around the edge of the root

ball circumference to permit rain or irrigation water to be retained and slowly infiltrate into the root ball perimeter to conserve soil moisture.

Mulch can be used to conserve soil moisture, to buffer soil temperature extremes, to control weeds and other competing vegetation, and to replenish organic matters and nutrients in the soil.

- k) Nutrient management:** Fertilisation may be unnecessary unless nutrient deficiency is confirmed. Moderate release of nutrients by decomposition of both mulch and organic matter added to backfill soil may be sufficient during the initial establishment period

Source: Greening, Landscape and Tree Management Section Development Bureau The Government of the Hong Kong Special Administrative Region, 2014)

UNIVERSITY OF AGRICULTURAL SCIENCES GKVK, BANGALORE
DEPARTMENT OF SOIL SCIENCE AND AGRICULTURAL CHEMISTRY

SS&AC/ 512 /2020-21

02-09-2020

To,

SHRI SUBRAMANYA GUDGE
 CHIEF ENGINEER (UG-1)
 BANGALORE METRO RAIL CORPORATION LTD.,
 REGD. OFFICE: BMTC COMPLEX, 3RD FLOOR, K.H. ROAD
 SHANTINAGAR, BANGALORE- 560 027

Sir,

Sub: Analytical result of four soil samplesreg

Ref: DR/ STA/TT -116/ 2020-21

dt:-27-08-2020

Please find here with the analytical results of four soil samples provided by you (BMRCL/0163/P-2/CE_UG/ RT-01/2020/3882) for analysis in the Dept. of Soil Science and Agricultural Chemistry, College of Agriculture, GKVK, Bangalore-65

Soil samples

Parameters	17 Diary circle Existing tree location	18 KMF translocation area	19 Lakkasandra existing tree locality	20 NDRI translocation area
pH (1:2.5)	6.79	6.88	5.83	5.02
Electrical conductivity (dS/m)(1: 2.5)	0.50	0.31	0.18	0.14
Organic carbon (%)	0.38	0.46	0.38	0.40
Nitrogen(kg ha ⁻¹)	315.08	302.11	388.86	315.08
Phosphorus (kg ha ⁻¹)	64.28	60.34	12.47	53.27
Potassium(kg ha ⁻¹)	479.0	274.0	316.50	350.50
Calcium (meq/100 g)	7.5	8.00	4.80	4.00
Magnesium (meq/100 g)	2.0	2.60	1.00	1.20
Sulphur (ppm)	3.99	4.00	4.77	3.66
Iron (ppm)	4.86	5.00	8.16	10.43
Manganese (ppm)	5.00	4.65	7.04	7.11
Zinc (ppm)	0.54	0.44	0.50	0.52
Copper (ppm)	0.36	0.28	0.46	0.20
Boron (ppm)	-	0.08	-	-

Inference: The four soil samples provided for analysis varies from acidic to slightly acidic in nature, low to medium in salt content and organic carbon content and contain high quantities of major nutrients (N,P,K as per standards). Therefore with proper nutrient application and use of amendments soil is suitable for tree shifting .

The result should not be utilized for legal / commercial purposes without prior consent of the Director of Research.

Forwarded to
 Director of Research

NO. DR/STA/TT-116/2020-21 dt. 2/9/2020 Yours faithfully
 COUNTERSIGNED

Professor and Head

Professor and Head

Dept. of Soil Science & Agril. Chemistry
 College of Agriculture, U.A.S., GKVK,
 Bangalore - 560 067

Director of Research
 University of Agricultural Sciences
 GKVK, Bangalore-560 065

UNIVERSITY OF AGRICULTURAL SCIENCES, BANGLORE
DEPARTMENT OF SOIL SCIENCE AND AGRICULTURAL CHEMISTRY
COLLEGE OF AGRICULTURE, GKVK CAMPUS
Soil and Irrigation Water Parameters Interpretation
Limits of Nutrients in Soil/ಪುಣ್ಯನಲ್ಲಿನ ಪೋಷಕಾಂಶಗಳ ಮಿತಿಗಳು

Parameters			
pH	ರಸವರ	ಏದ್ಯತ್ ವಾಹಕತ್ವ, ದ್ರವ್ಯಮಾನ/ಮೀ	
	<6.5 ಹಳಿ	<0.8 ಸಹಜ ಸ್ಥಿತಿ	0.8-1.6
	>8.5 ಕ್ಷಾರ	6.5-8.5 ಕ್ಷೇಷ್ಣ	>1.6-2.5. ಪಾಸಿಟಿವ್

Parameters			
OC(Organic Carbon%)	ಸಾಮಾನ್ಯ ಇಂಗೂಲ (%)	<0.50	0.5 - 0.75
Nitrogen (Kg ha ⁻¹)	ನಾರ್ಜನ (N) ಕೆ.ಜಿ./ಹೆ.	<280	280-560
Phosphorus (Kg ha ⁻¹)	ಫಾಸ್ಫರಸ್ (P2O5) ಕೆ.ಜಿ./ಹೆ.	<22.9	22.9-56.33
Potassium (Kg ha ⁻¹)	ಪೊಟ್ಯಾಷ್ (K2O) ಕೆ.ಜಿ./ಹೆ.	<141	141-336
Sulphur (ppm)/mg kg ⁻¹	ಸಲ್ಫರ್ (S) ಪಿ.ಪಿ.ಎಂ	<10	10-20
Iron (ppm)/mg kg ⁻¹	ಐರನ್ (Fe) ಪಿ.ಪಿ.ಎಂ	<2.50	2.50-4.50
Manganese (ppm)/mg kg ⁻¹	ಮ್ಯಾಂಗನೀಸ್ (Mn) ಪಿ.ಪಿ.ಎಂ	<1.00	1.00-2.00
Copper (ppm)/mg kg ⁻¹	ಕಾಪರ್ (Cu) ಪಿ.ಪಿ.ಎಂ	<0.10	0.10-0.20
Zinc (ppm)/mg kg ⁻¹	ಜಿಂಕ್ (Zn) ಪಿ.ಪಿ.ಎಂ	<0.60	0.60-1.00
Boron (ppm)/mg kg ⁻¹	ಬೋರಾನ್ (B) ಪಿ.ಪಿ.ಎಂ	<0.25	0.25-0.50

Irrigation Water Quality Parameters/ ನೀರಾವರಿ ನೀರಿನ ಗುಣಮಟ್ಟ ನಿರ್ದೇಶಾಂಕ

Parameter	Low/ಕಡಿಮೆ	Medium/ಮಧ್ಯಮ	High/ಹೆಚ್ಚು
pH ರೇಷಮೆ	<6.5	6.5-7.5	>7.5

Salinity Classes			
Parameter	Low/ಕಡಿಮೆ	Medium/ಮಧ್ಯಮ	High/ಹೆಚ್ಚು
C(DS/M) ಏದ್ಯತ್ ವಾಹಕತ್ವ	<0.25	0.25-0.75	>0.75-2.25
Chlorides(Cl)(ppm)/ಕ್ಲೋರೈಡ್	<2-5	5-12	12-20

Sodicity Classes			
Parameter	Low/ಕಡಿಮೆ	Medium/ಮಧ್ಯಮ	High/ಹೆಚ್ಚು
SAR(Sodium adsorption ratio) ಸೋಡಿಯಂ ಹೆಚ್ಚಳ/ಹಿರಿಕೆ ಅನುಪಾತ	(S ₁) <10	(S ₂) 10-18	(S ₃) 18-26
	Very High/ಅತಿ ಹೆಚ್ಚು (S ₄) >26		

Bicarbonate (HCO ₃) Classes			
Parameter	Low (RSC ₁) / ಕಡಿಮೆ	Medium (RSC ₂) / ಮಧ್ಯಮ	High (RSC ₃) / ಹೆಚ್ಚು
RSC(Residual Sodium carbonate) ಸೇರಿಸಬೇಕಾದ ಸೋಡಿಯಂ ಕಾರ್ಬೊನೇಟ್	<1.25	1.25-2.50	>2.50

PROFESSOR and Head
 Dept of Soil Science & Agril. Chemistry
 College of Agriculture, U.A.S. GKVK, Bangalore - 560 085

2016

20

UNIVERSITY OF AGRICULTURAL SCIENCES GKVK, BANGALORE
DEPARTMENT OF SOIL SCIENCE AND AGRICULTURAL CHEMISTRY

SS&AC/ /2020-21

20-08-2020

To,

✓ SHRI SUBRAMANYA GUDGE

CHIEF ENGINEER (UG-1)

BANGALORE METRO RAIL CORPORATION LTD.,

REGD. OFFICE: BMTC COMPLEX, 3RD FLOOR, K.H. ROAD

SHANTINAGAR, BANGALORE- 560 027

Sir,

Sub: Analytical result of two soil samplesreg

Ref: DR/ STA/TT -102/ 2020-21

dt:-18-08-2020

Please find here with the analytical results of two soil samples provided by you (**BMRCL/P-2/CE_UG/RT-02/2020/3292**) for analysis in the Dept. of Soil Science and Agricultural Chemistry, College of Agriculture, GKVK, Bangalore-65

Soil samples

Parameters	12 Present location N.E. corner army public school	13 Proposed location Parade ground
pH (1:2.5)	7.20	8.5
Electrical conductivity (dS/m)	0.04	0.19
Organic carbon (%)	0.27	0.28
Nitrogen(kg ha ⁻¹)	238.3	280.5
Phosphorus (kg ha ⁻¹)	10.39	12.37
Potassium(kg ha ⁻¹)	97.5	198.0
Calcium (meq/100 g)	5.00	15.0
Magnesium (meq/100 g)	1.80	5.60
Sulphur (ppm)	4.44	5.59
Iron (ppm)	3.65	1.64
Manganese (ppm)	2.10	2.87
Zinc (ppm)	0.44	0.54
Copper (ppm)	0.28	0.44
Boron (ppm)	0.12	0.08


Inference: The two soil samples provided for analysis varies from neutral to alkaline in nature, low in salt content and organic carbon content and contain low quantities of major nutrients (N,P,K and all other parameters as per standards). Therefore with proper nutrient application and use of amendments soil is suitable for tree shifting .

The result should not be utilized for legal / commercial purposes without prior consent of the Director of Research.

Forwarded to
Director of Research


NO. DR/STA/TT-102/2020-21 dt:-20/8/20 Yours faithfully

COUNTERSIGNED


Director of Research

University of Agricultural Sciences

GKVK Bangalore-560 065


Professor and Head

Department of Soil Science & Agricultural Chemistry
GKVK Bangalore-560 065

UNIVERSITY OF AGRICULTURAL SCIENCES, BANGLORE
DEPARTMENT OF SOIL SCIENCE AND AGRICULTURAL CHEMISTRY
COLLEGE OF AGRICULTURE, GKVK CAMPUS

Soil and Irrigation Water Parameters Interpretation
Limits of Nutrients in Soil / ಮಣ್ಣಿನಲ್ಲಿನ ಪೋಷಕಾಂಶಗಳ ಮಿತಿಗಳು

Parameters				
pH	ರಸಸಾರ	<6.5 ಹುಳಿ	6.5-8.5 ತಟಸ್ಥ	>8.5 ಕ್ಷಾರ
EC (dS/m)	ವಿದ್ಯುತ್ ವಾಹಕತ್ವ, ಡೆಸಿಸಿ, ಸೈಮನ/ಮೀ	<0.8 ಸಹಜ ಸ್ಥಿತಿ	0.8-1.6	>1.6-2.5 ಪಾನಿಕಾರಕ

Parameters		Low/ಕಡಿಮೆ	Medium/ಮಧ್ಯಮ	High/ಹೆಚ್ಚು
OC(Organic Carbon%)	ಸಾವಯವ ಇಂಗಾಲ (%)	<0.50	0.5 - 0.75	>0.75
Nitrogen (Kg ha ⁻¹)	ಸಾರಜನಕ (N) ಕೆ.ಜಿ./ಹೆ.	<280	280-560	>560
Phosphorus (Kg ha ⁻¹)	ರಂಜಕ (P ₂ O ₅) ಕೆ.ಜಿ./ಹೆ.	<22.9	22.9-56.33	>56.33
Potassium (Kg ha ⁻¹)	ಪೊಟ್ಯಾಶ್ (K ₂ O) ಕೆ.ಜಿ./ಹೆ.	<141	141-336	>336
Sulphur (ppm)/mg kg ⁻¹	ಗಂಧಕ(S) ಪಿ.ಪಿ.ಎಂ	<10	10-20	>20
Iron (ppm)/mg kg ⁻¹	ಕಬ್ಬಿಣ (Fe) ಪಿ.ಪಿ.ಎಂ	<2.50	2.50-4.50	>4.50
Manganese (ppm)/mg kg ⁻¹	ಮ್ಯಾಂಗನೀಸ್(Mn) ಪಿ.ಪಿ.ಎಂ	<1.00	1.00-2.00	>2.00
Copper (ppm)/mg kg ⁻¹	ತಾಮ್ರ (Cu) ಪಿ.ಪಿ.ಎಂ	<0.10	0.10-0.20	>0.20
Zinc (ppm)/mg kg ⁻¹	ಸತು (Zn) ಪಿ.ಪಿ.ಎಂ	<0.60	0.60-1.00	>1.00
Boron (ppm)/mg kg ⁻¹	ಬೋರಾನ್ (B) ಪಿ.ಪಿ.ಎಂ	<0.25	0.25-0.50	>0.50

Irrigation Water Quality Parameters/ ನೀರಾವರಿ ನೀರಿನ ಗುಣಮಟ್ಟ ನಿರ್ಯತಾಂಕ

Parameter	Low/ಕಡಿಮೆ	Medium/ಮಧ್ಯಮ	High/ಹೆಚ್ಚು
pH ರಸಸಾರ	<6.5	6.5-7.5	>7.5

Salinity Classes

Parameter	Low/ಕಡಿಮೆ (C ₁)	Medium/ಮಧ್ಯಮ (C ₂)	High/ಹೆಚ್ಚು (C ₃)	Very High/ಅತಿ ಹೆಚ್ಚು (C ₄)
EC(dS/M) ವಿದ್ಯುತ್ ವಾಹಕತ್ವ	<0.25	0.25-0.75	0.75-2.25	>2.25
Chlorides(Cl)(ppm)/ಕ್ಲೋರೈಡ್	<2-5	5-12	12-20	>20

Sodicity Classes

Parameter	Low/ ಕಡಿಮೆ (S ₁)	Medium/ಮಧ್ಯಮ (S ₂)	High/ಹೆಚ್ಚು (S ₃)	Very High/ ಅತಿ ಹೆಚ್ಚು (S ₄)
SAR(Sodium adsorption ratio) ಸೋಡಿಯಂ ಹೊರಹೀರುವಿಕೆ ಅನುಪಾತ	<10	10-18	18-26	>26

Bicarbonate (HCO₃) Classes

Parameter	Low (RSC ₁) / ಕಡಿಮೆ	Medium (RSC ₂) /ಮಧ್ಯಮ	High (RSC ₃) /ಹೆಚ್ಚು
RSC(Residual Sodium carbonate) ಉಳಿಕೆಯ ಸೋಡಿಯಂ ಕಾರ್ಬೋನೇಟ್	<1.25	1.25-2.50	>2.50

[Signature]
Professor and Head
Dept. of Soil Science & Agril. Chemistry
College of Agriculture, U.A.S., G.K.V.K.
Bangalore - 560 065

Proposed location (Old Military Fram, Hebbal) for Transplantation of trees from Contonment Station, Tannery Road Station and Nagawara Station



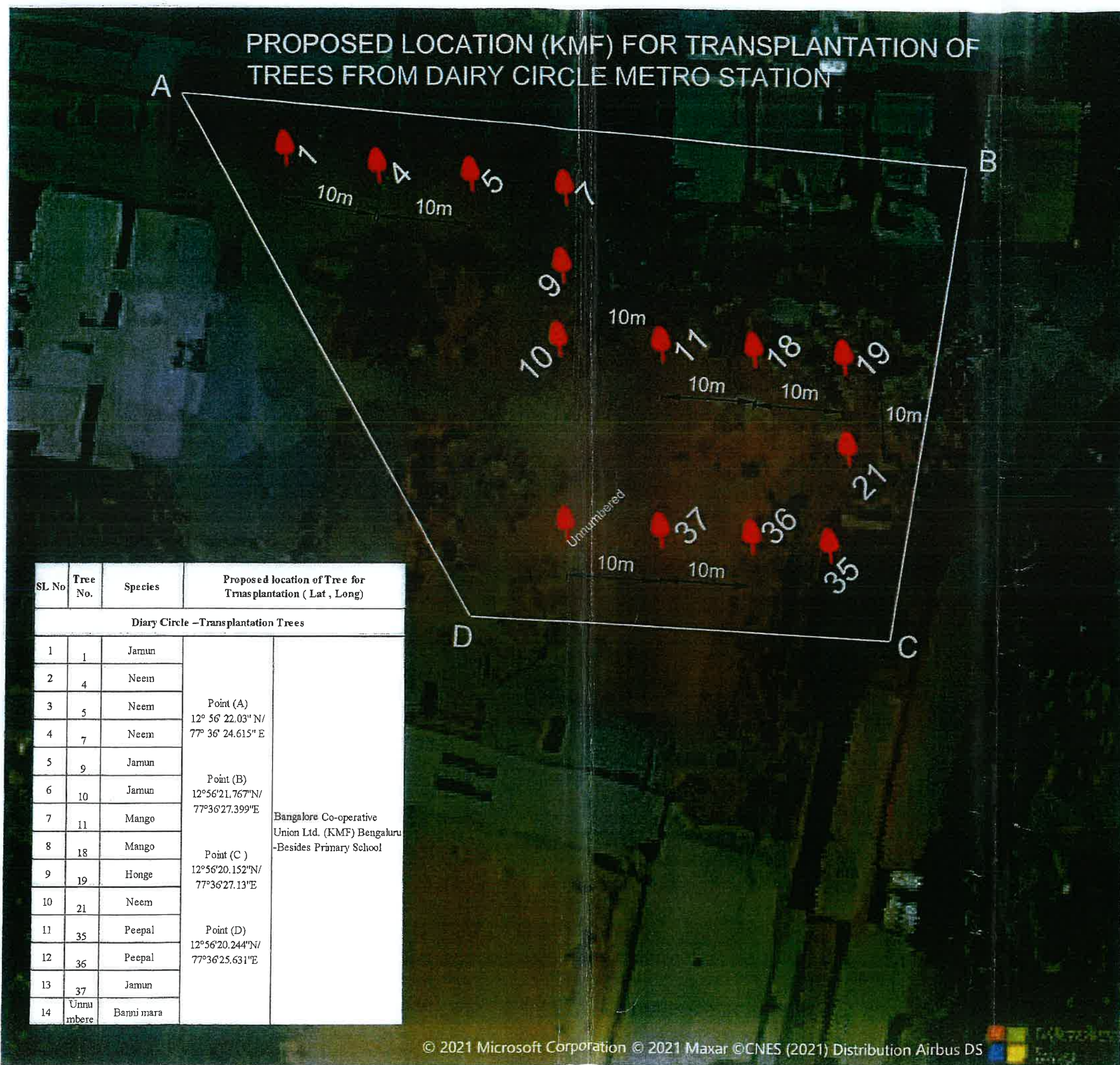
Proposed location (NDR) for Transplantation of trees from Lakkasandra Metro Station



Proposed location (Parade Ground) for Transplantation of trees from M G Road



PROPOSED LOCATION (KMF) FOR TRANSPLANTATION OF TREES FROM DAIRY CIRCLE METRO STATION



SL No	Tree No.	Species	Proposed location of Tree for Transplantation (Lat , Long)	
Diary Circle –Transplantation Trees				
1	1	Jamun	Point (A) 12° 56' 22.03" N/ 77° 36' 24.615" E	Bangalore Co-operative Union Ltd. (KMF) Bengaluru -Besides Primary School
2	4	Neem		
3	5	Neem		
4	7	Neem		
5	9	Jamun	Point (B) 12°56'21.767"N/ 77°36'27.399"E	
6	10	Jamun		
7	11	Mango		
8	18	Mango	Point (C) 12°56'20.152"N/ 77°36'27.13"E	
9	19	Honge		
10	21	Neem		
11	35	Peepal	Point (D) 12°56'20.244"N/ 77°36'25.631"E	
12	36	Peepal		
13	37	Jamun		
14	Unnumbered	Banni mara		


B.C. NATARAJA
 Chief Engineer
 Special & Environmental Management Unit (SEMU)
 Bangalore Metro Rail Corporation Ltd
 3rd Floor, BMTC Complex, K.H. Road
 Shanthinagar, Bengaluru - 560 027

Proposed location (KMF) for Transplantation of trees from Dairy Circle Metro Station

N



Legend



Transplantation
Area

B.C. Nataraj

PROPOSED LOCATION (KMF) FOR TRANSPLANTATION OF TREES FROM DAIRY CIRCLE METRO STATION

N
1:3,960



GPS Readings (Datum: WGS84)	
Locations	Latitude/Longitude
A	N12 56 22.0 E77 36 24.6
B	N12 56 21.8 E77 36 27.4
C	N12 56 20.2 E77 36 27.1
D	N12 56 20.2 E77 36 25.6

B.C. Nataraja
B.C. NATARAJA
Chief Engineer
Social & Environmental Management Unit (SEMU)

- Legend**
- Location Points
 - Trans Location Areas
 - Sy No Boundary Adugodi Village

Bangalore Metro Rail Corporation Ltd.
3rd Floor, BMTC Complex, K.M. Road
Shanthinagar, Bengaluru - 560 027

Proposed location (NDRI) for Transplantation of trees from Lakkasandra Metro Station



Legend



Legend
Transplantation
Area

B.C. Noh
CE/SEM V

PROPOSED LOCATION (NDRI) FOR TRANSPLANTATION OF TREES FROM LAKKA SANDRA METROSTATION

N
1:3,960



GPS Readings (Datum: WGS84)	
Locations	Latitude/longitude
A	N12 56 55.1 E77 36 52.5
B	N12 56 55.1 E77 36 53.8
C	N12 56 51.5 E77 36 52.6
D	N12 56 51.6 E77 36 52.1

B.C. Nataraja
B.C. NATARAJA
Chief Engineer
Social & Environmental Management Unit (SEMU)
Bangalore Metro Rail Corporation Ltd.
3rd Floor, BMTCL Complex, K.H. Road
Shanthinagar, Bengaluru - 560 027

Legend

- Location Points
- Transplantation Area
- Sy No Boundary

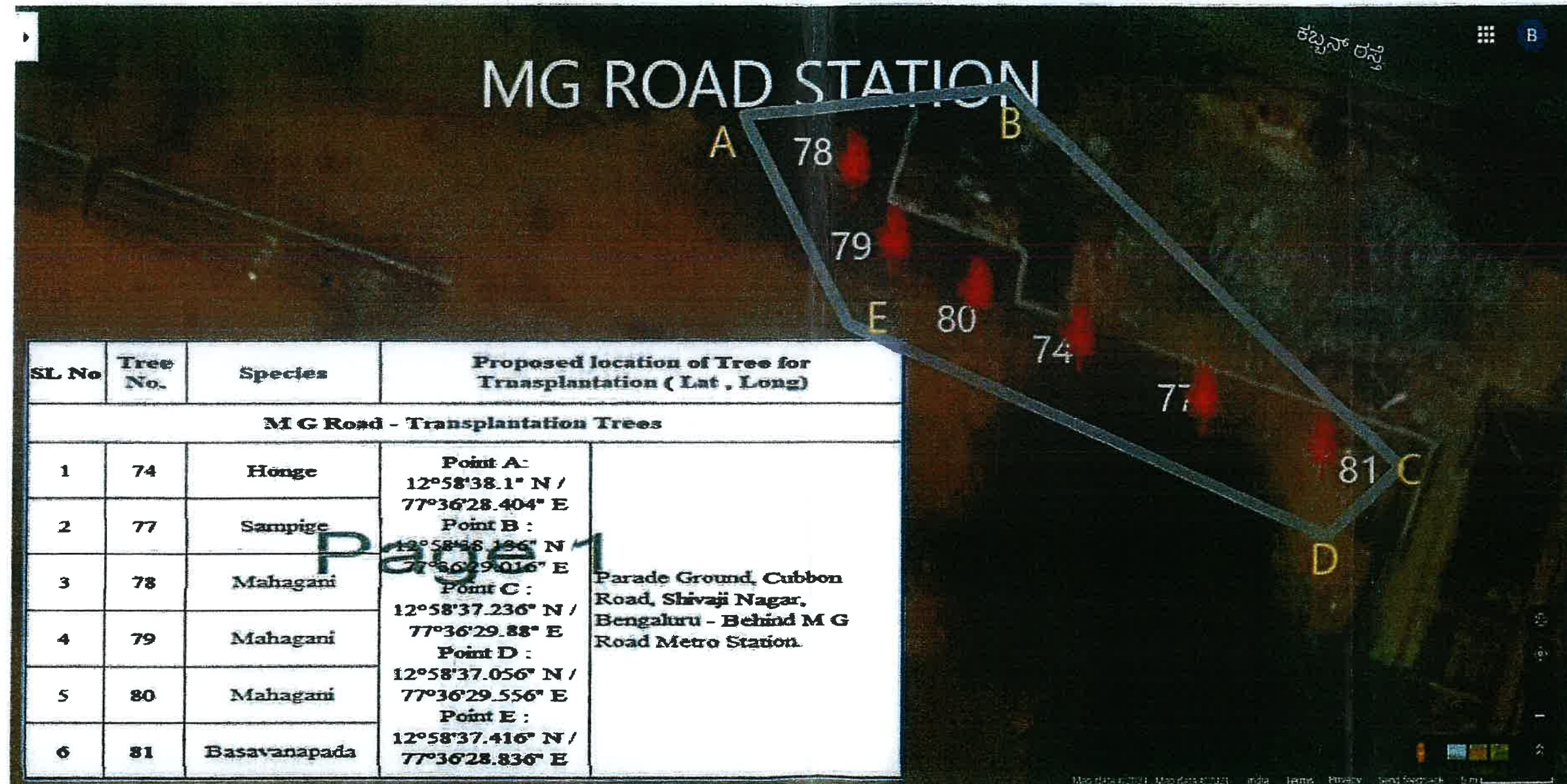
PROPOSED LOCATION (NDRI) FOR TRANSPLANTATION OF TREES FROM LAKKASANDRA METRO STATION



SL No	Tree No.	Species	Proposed location of Tree for Transplantation (Lat , Long)	
Lakkasandra - Transplantation Trees				
1	22	Rain Tree	Point (A)	National Dairy Research Institute (NDRI), Bengaluru Near North side Compound Wall
2	23A	Spathodea	12°56'55.118"N/ 77°36'52.509"E	
	23B	Spathodea	Point (B)	
3	24	Banyan tree	12°56'55.099"N/ 77°36'53.792"E	
4	25	Peepal	Point (C)	
5	26	Jamun	12°56'51.46"N/ 77°36'52.623"E	
6	28	Fig	Point (D)	
7	31	Mango tree	12°56'51.585"N/ 77°36'52.08"E	
8	33	Peepal		

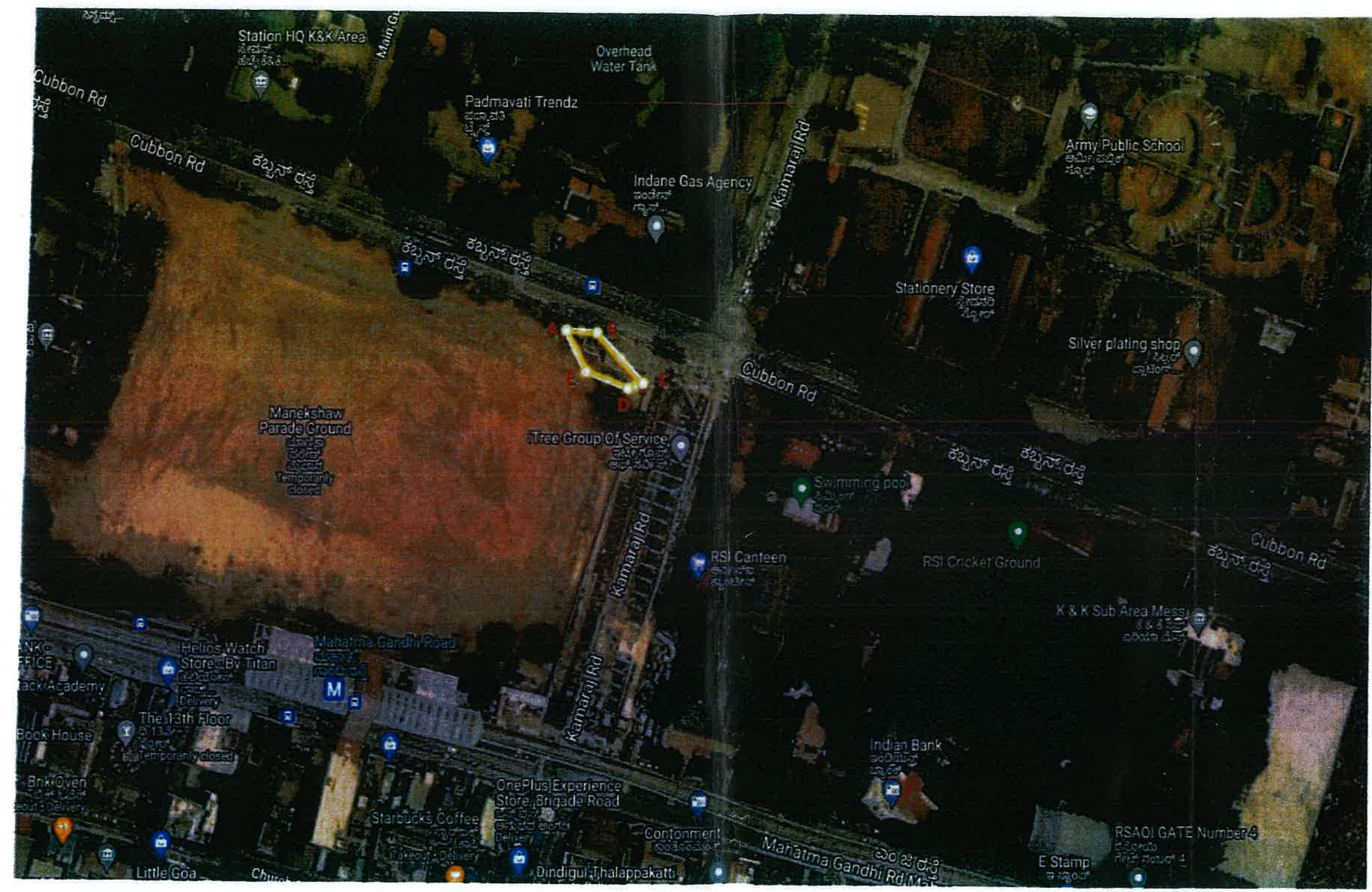
B.C. Natesh
CE/SEMU

PROPOSED LOCATION (PARADE GROUND) FOR TRANSPLANTATION OF TREES FROM M G ROAD



B.C. NATARAJA
 Chief Engineer
 Social & Environmental Management Unit (SEMU)
 Bangalore Metro Rail Corporation Ltd.
 3rd Floor, BMTC Complex, K.H. Road
 Shanthinagar, Bengaluru - 560 027

Proposed location (Parade Ground) for Transplantation of trees from M G Road



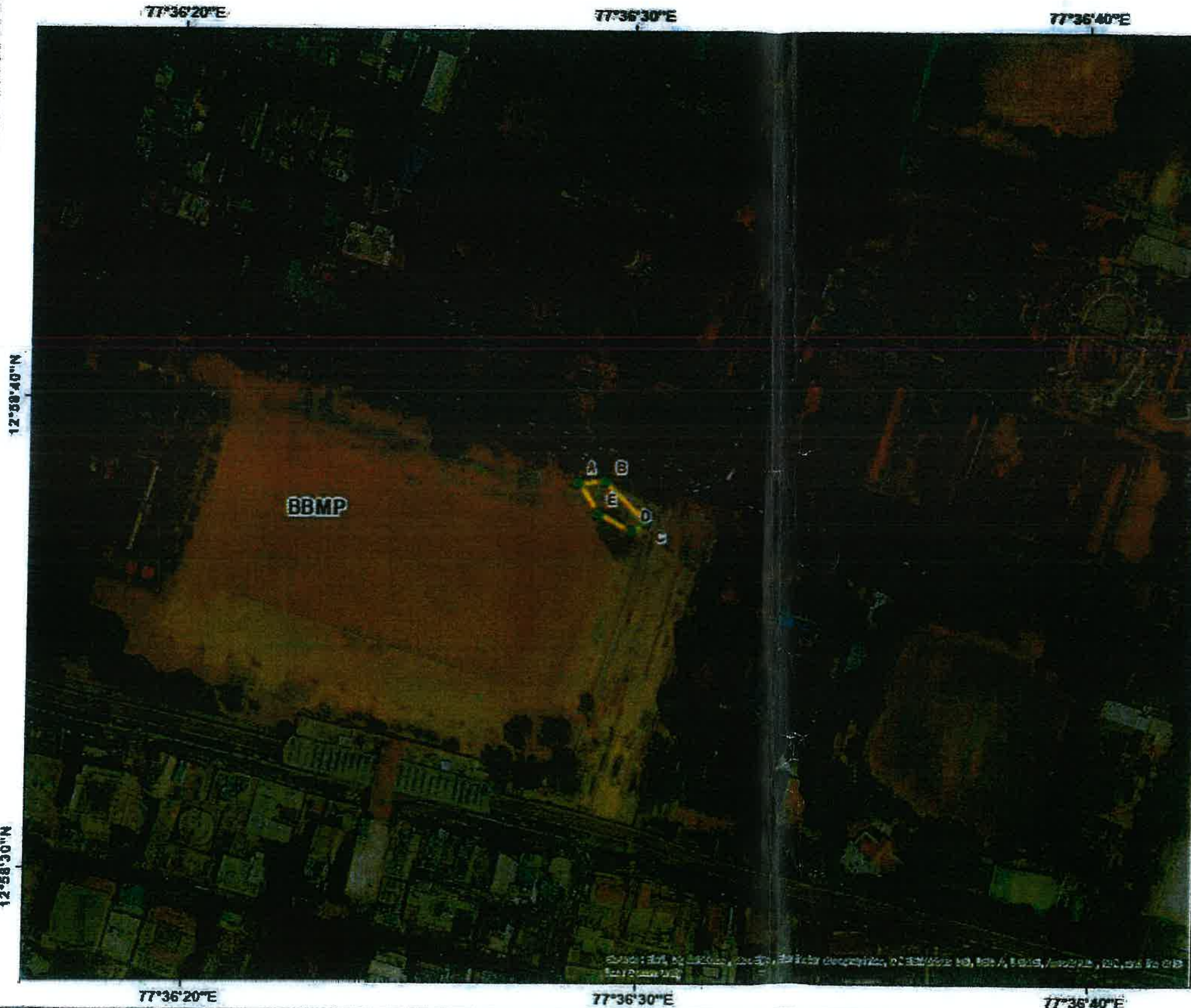
Legend

Transplantation
Area

B.C. nate
CE / SEMU

PROPOSED LOCATION (PARADE GROUND) FOR TRANSPLANTATION OF TREES FROM M G ROAD

N
1:2,500



GPS Readings (Datum: WGS84)	
Locations	Latitude/Longitude
A	N12 58 38.1 E77 36 28.4
B	N12 58 38.1 E77 36 29.0
C	N12 58 37.2 E77 36 29.9
D	N12 58 37.1 E77 36 29.6
E	N12 58 37.4 E77 36 28.8

B.C. Nataraja
B.C. NATARAJA
Chief Engineer
Social & Environmental Management Unit (SEMU)
Bangalore Metro Rail Corporation Ltd.
3rd Floor, BMTC Complex, K.H. Road
Shanthinagar, Bangalore - 560 027

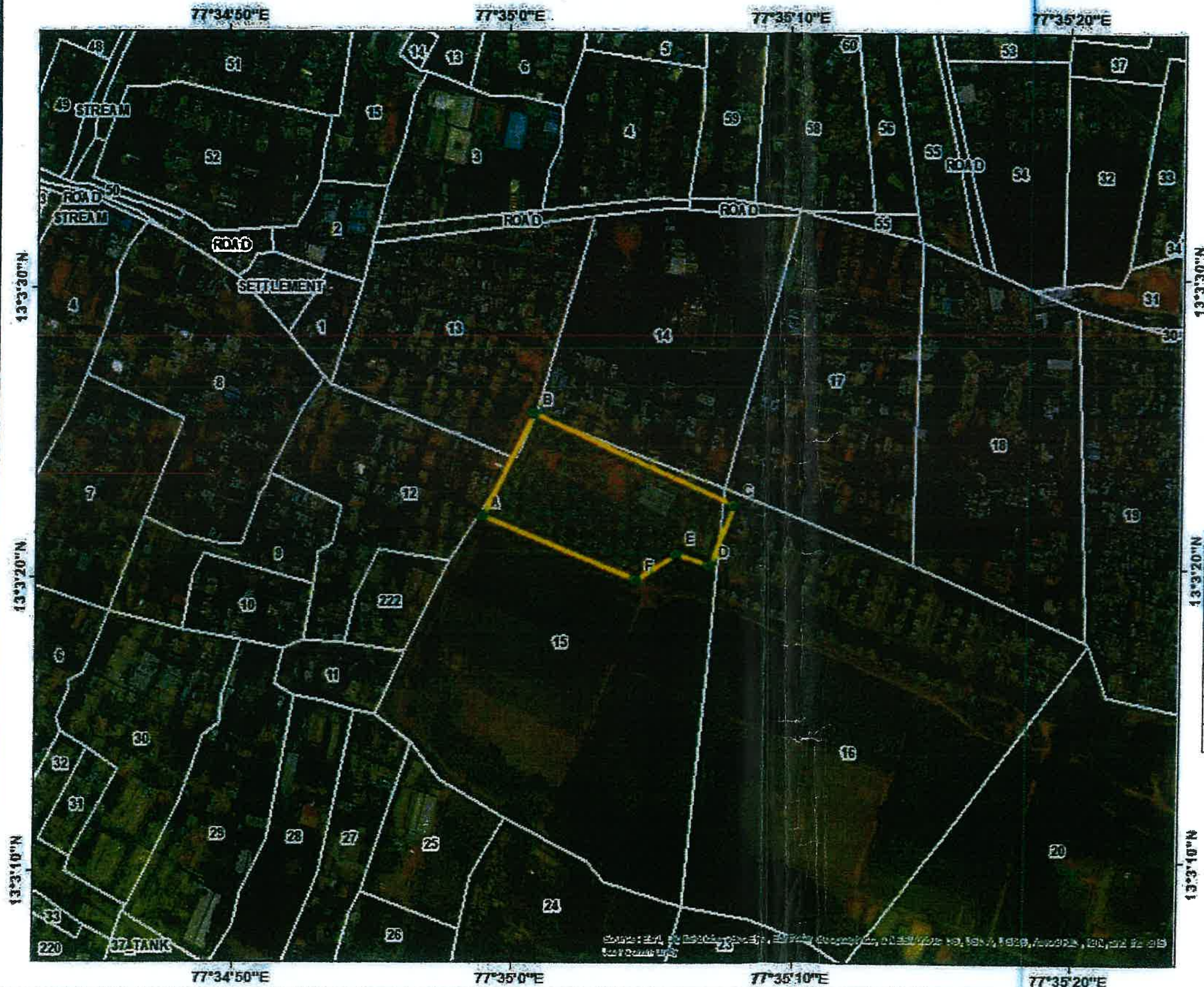
Legend
● Location Points
■ Transplantation Area

N



**PROPOSED TRANSPLANTATION LOCATION OLD MILITARY FARM, HEBBAL) OF TREES
FROM CANTONMENT STATION, TANNERY ROAD STATION AND NAGAWARA STATION**

N
1:3,960



GPS Readings (Datum: WGS84)	
Locations	Latitude/Longitude
A	N13 03 22.0 E77 34 58.7
B	N13 03 25.5 E77 35 00.5
C	N13 03 22.3 E77 35 07.6
D	N13 03 20.2 E77 35 06.7
E	N13 03 20.6 E77 35 05.6
F	N13 03 19.7 E77 35 04.2

B.C. Nataraja

B.C. NATARAJA
Chief Engineer

Social & Environmental Management Unit (SEMU)
Metro Rail Corporation Ltd.
1st Floor, BMTC Complex, K.H. Road
Shanthinagar, Bengaluru - 560 027

Legend

- Location Points
- Transplantation Area
- Sy No Boundary

**R6 UG South Ramp (Jayanagar Fire Station) to North Ramp
(Nagawara) Except Langford Station and All Saint's Church (BBMP)**



**R6 UG South Ramp (Jayanagar Fire Station) to North Ramp
(Nagawara) Except Langford Station and All Saint's Church (BBMP)**



**R6 UG South Ramp (Jayanagar Fire Station) to North Ramp
(Nagawara) Except Langford Station and All Saint's Church (BBMP)**



**R6 UG South Ramp (Jayanagar Fire Station) to North Ramp
(Nagawara) Except Langford Station and All Saint's Church (BBMP)**



**R6 UG South Ramp (Jayanagar Fire Station) to North Ramp
(Nagawara) Except Langford Station and All Saint's Church (BBMP)**



**R6 UG South Ramp (Jayanagar Fire Station) to North Ramp
(Nagawara) Except Langford Station and All Saint's Church (BBMP)**



**R6 UG South Ramp (Jayanagar Fire Station) to North Ramp
(Nagawara) Except Langford Station and All Saint's Church (BBMP)**



**R6 UG South Ramp (Jayanagar Fire Station) to North Ramp
(Nagawara) Except Langford Station and All Saint's Church (BBMP)**



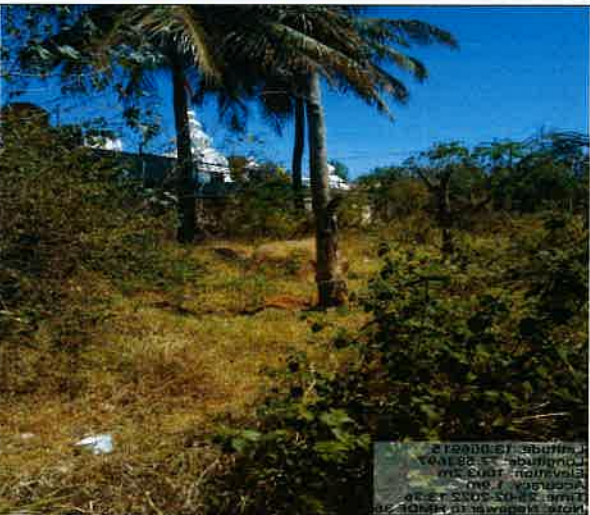
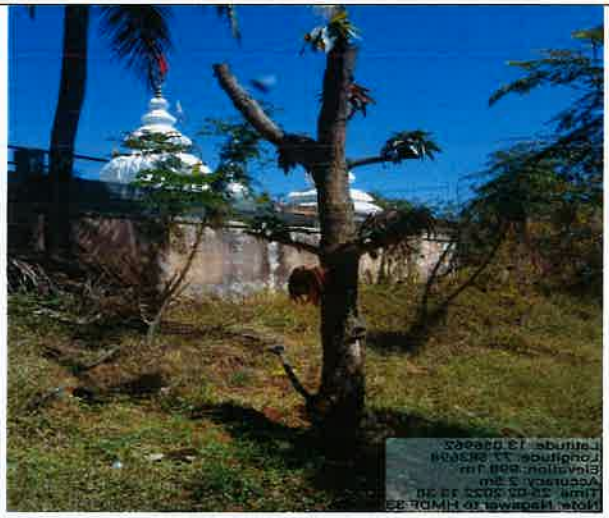
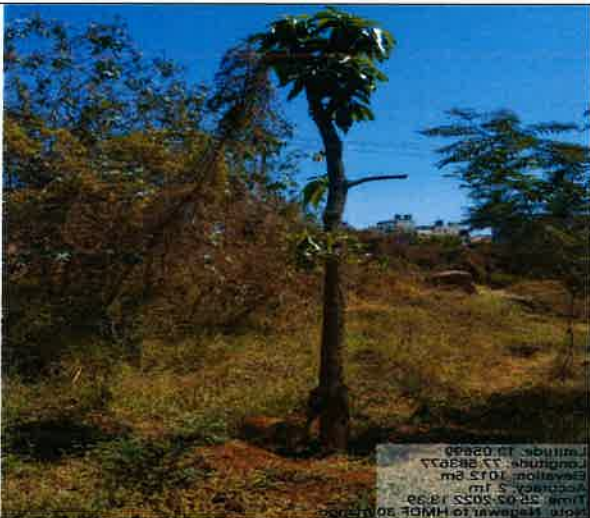
R6 UG Translocated Tree



R6 UG Translocated Tree



R6 UG Translocated Tree



R6 UG Translocated Tree



R6 UG Translocated Tree



R6 UG Translocated Tree

